Claims 1-3, and 5-32 are pending in the current application. Claim 1 stands not rejected. Claims 5-32 stand withdrawn and claims 2 and 3 stand rejected. Claims 2 and 3 have been revised to better bring out that the claims are drawn to particular embodiments of applicant's invention as it is defined in claim1. The Examiner rejected claims 2 and 3 under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, as well as under §112, first paragraph for non-enablement. The Examiner also rejected claims 2 and 3 under 35 USC §102(a) as being anticipated by **Thibodeau et al.** (Biochem. Cell Biol. Vol. 67, pages 653-660, 1989). In particular the Examiner argued that claims 2 and 3 are not drawn to "the PARP homolog of claim 1", but rather to "a functional equivalent of PARP homolog as claimed in claim 1" and so are not limited to all the limitations of the PARP homolog of claim 1. The Examiner then argued from this that because the limitations of claim 1 are not incorporated into claims 2 and 3, **Thibodeau et al.** continues to anticipate claims 2 and 3.

The Applicant has amended claims 2 and 3 to recite "The PARP homolog and functional equivalents thereof which are at least 85% homologous thereto, as defined in claim 1" in the preamble. The claims therefore more clearly bring out that the limitations of claim 1 are incorporated by reference, thereby obviating the §112 and §102 rejections. The applicants therefore request favorable action concerning the present application.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to Deposit Account No. 14.1437. Please credit any excess fees to such deposit account.

Respectfully submitted,
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APPENDIX I

Claim Amendments :

Amend claims 2 and 3 as set forth in the following listing of claims:

1. (previously presented) An isolated and purified poly(ADP-ribose) polymerase (PARP) homolog consisting of human PARP2 (SEQ ID NO: 2) and functional equivalents thereof which are at least 85% homologous thereto, exhibit poly(ADP-ribose)-synthesizing activity, and have an amino acid sequence which

a) has a functional NAD^+ binding domain comprising the sequence motif

$PX_n(S/T)GX_3GKGIYFA$ (SEQ ID NO:11)

in which n is an integral value from 1 to 5, and the X radicals are, independently of one another, any amino acid;

and

b) lacks a zinc finger sequence motif of the general formula

$CX_2CX_mHX_2C$ (SEQ ID NO:30)

in which

m is an integral value of 28 or 30, and the X radicals are, independently of one another, any amino acid.

2. (currently amended) ~~A functional equivalent of a~~ The-PARP homolog and functional equivalents thereof which are at least 85% homologous thereto as claimed in claim 1, wherein the functional NAD^+ binding domain comprises one of the following general sequence motifs:

$(S/T)XGLR(I/V)XPX_n(S/T)GX_3GKGIYFA$ (SEQ ID NO:12) or

$LLWHG(S/T)X_7IL(S/T)XGLR(I/V)XPX_n(S/T)GX_3GKGIYFAX_3S$ KSAXY (SEQ ID NO:13)

in which

n is an integral value from 1 to 5, and the X radicals are, independently of one another, any amino acid.

3. (currently amended) ~~A functional equivalent of a~~The PARP homolog and functional equivalents thereof which are at least 85% homologous thereto as claimed in claim 1, comprising at least another one of the following part-sequence motifs:

$LX_9NX_2YX_2QLLX(D/E)X_{10/11}WGRVG$ (SEQ ID NO: 15),
$AX_3FXKX_4KTXNXWX_5FX_3PXK$ (SEQ ID NO:16),
$QXL(I/L)X_2IX_9MX_{10}PLGKLX_3QIX_6L$ (SEQ ID NO:17),
$FYTXIPHXFGX_3PP$ (SEQ ID NO:18); and
$KX_3LX_2LXDIEXAX_2L$ (SEQ ID NO:19),

in which the X radicals are, independently of one another, any amino acid.

4. (canceled)

5. (withdrawn) A binding partner for PARP homologs as claimed in claim 1, selected from

a) antibodies and fragments thereof,

b) protein-like compounds which interact with a part-sequence of the protein, and

c) low molecular weight effectors which modulate the catalytic PARP activity or another biological function of a PARP molecule.

6. (withdrawn) A nucleic acid comprising

a) a nucleotide sequence coding for at least one PARP homolog as claimed in claim 1, or the complementary nucleotide sequence thereof;

b) a nucleotide sequence which hybridizes with a sequence as specified in a) under stringent conditions; or

c) nucleotide sequences which are derived from the nucleotide sequences defined in a) and b) through the degeneracy of the genetic code.

7. (withdrawn) A nucleic acid as claimed in claim 6, comprising

a) nucleotides +3 to +1715 shown in SEQ ID NO:1;
b) nucleotides +242 to +1843 shown in SEQ ID NO:3;
c) nucleotides +221 to +1843 shown in SEQ ID NO:5;
d) nucleotides +112 to +1710 shown in SEQ ID NO:7; or
e) nucleotides +1 to +1584 shown in SEQ ID NO:9.

8. (withdrawn) An expression cassette comprising, under the genetic control of at least one regulatory nucleotide sequence, at least one nucleotide sequence as claimed in claim 6.

9. (withdrawn) A recombinant vector comprising at least one expression cassette as claimed in claim 8.

10. (withdrawn) A recombinant microorganism comprising at least one recombinant vector as claimed in claim 9.

11. (withdrawn) A transgenic mammal comprising a vector as claimed in claim 9.

12. (withdrawn) A PARP-deficient mammal or PARP-deficient eukaryotic cell, in which functional expression of at least one gene which codes for a PARP homolog as claimed in claim 1 is inhibited.

13. (withdrawn) An in vitro detection method for PARP inhibitors, which comprises

a) incubating an unsupported or supported polyADP-ribosylatable target with a reaction mixture comprising

a1) a PARP homolog as claimed in claim 1,

a2) a PARP activator; and

a3) a PARP inhibitor or an analyte in which at least one PARP inhibitor is suspected;

b) carrying out the polyADP ribosylation reaction; and

c) determining the polyADP ribosylation of the target qualitatively or quantitatively.

14. (withdrawn) A method as claimed in claim 13, wherein the PARP homolog is preincubated with the PARP activator and the PARP inhibitor or an analyte in which at least one PARP inhibitor is suspected, before the polyADP ribosylation reaction is carried out.

15. (withdrawn) A method as claimed in claim 13, wherein the polyADP-ribosylatable target is a histone protein.

16. (withdrawn) A method as claimed claim 13, wherein the PARP activator is activated DNA.

17. (withdrawn) A method as claimed in claim 13, wherein the polyADP ribosylation reaction is started by adding NAD^+.

18. (withdrawn) A method as claimed in claim 13, wherein the polyADP ribosylation of the supported target is determined using anti-poly(ADP-ribose) antibodies.

19. (withdrawn) A method as claimed in claim 13, wherein the unsupported target is labeled with an acceptor fluorophore.

20. (withdrawn) A method as claimed in claim 19, wherein the polyADP ribosylation of the unsupported target is determined using anti-poly(ADP-ribose) antibody which is labeled with a donor fluorophore which is able to transfer energy to the acceptor fluorophore.

21. (withdrawn) A method as claimed in claim 19, wherein the target is biotinylated histone, and the acceptor fluorophore is coupled thereto via avidin or streptavidin.

22. (withdrawn) A method as claimed in claim 20, wherein the anti-poly(ADP-ribose) antibody carries a europium cryptate as donor fluorophore.

23. (withdrawn) An in vitro screening method for binding partners for a PARP molecule, which comprises

a1) immobilizing at least one PARP homolog as claimed in claim 1 on a support;

b1) contacting the immobilized PARP homolog with an analyte in which at least one binding partner is suspected; and

c1) determining, where appropriate after an incubation period, analyte constituents bound to the immobilized PARP homolog;

or

a2) immobilizing on a support an analyte which comprises at least one possible binding partner for a PARP molecule;

b2) contacting the immobilized analyte with at least one PARP homolog as claimed in claim 1 for which a binding partner is sought; and

c2) examining the immobilized analyte, where appropriate after an incubation period, for binding of the PARP homolog.

24. (withdrawn) A method for the qualitative or quantitative determination of nucleic acids encoding a PARP homolog as claimed in claim 1, which comprises

a) incubating a biological sample with a defined amount of an exogenous nucleic acid, hybridizing under stringent conditions, determining the hybridizing nucleic acids and, where appropriate, comparing with a standard; or

b) incubating a biological sample with a pair of oligonucleotide primers with specificity for a PARP homolog-encoding nucleic acid, amplifying the nucleic acid, determining the amplification product and, where appropriate, comparing with a standard.

25. (withdrawn) A method for the qualitative or quantitative determination of a PARP homolog as claimed in claim 1, which comprises

a) incubating a biological sample with a binding partner specific for a PARP homolog,

b) detecting the binding partner/PARP complex and, where appropriate,

c) comparing the result with a standard.

26. (withdrawn) A method as claimed in claim 25, wherein the binding partner is an antibody or a binding fragment thereof, which carries a detectable label where appropriate.

27. (withdrawn) A method as claimed in claim 24 for diagnosing energy deficit-mediated illnesses.

28. (withdrawn) A method for determining the efficacy of PARP effectors, which comprises

a) incubating a PARP homolog as claimed in claim 1 with an analyte which comprises an effector of a physiological or pathological PARP activity; removing the effector again where appropriate; and

b) determining the activity of the PARP homolog, where appropriate after adding substrates or cosubstrates.

29. (withdrawn) A gene therapy composition, which comprises in a vehicle acceptable for gene therapy a nucleic acid construct which

a) comprises an antisense nucleic acid against a coding nucleic acid as claimed in claim 6; or

b) a ribozyme against a nucleic acid as claimed in claim 6; or

c) codes for a specific PARP inhibitor.

30. (withdrawn) A pharmaceutical composition comprising, in a pharmaceutically acceptable vehicle, at least one PARP protein as claimed in claim 1, at least one PARP binding partner or at least one coding nucleotide sequence.

31. (withdrawn) The use of low molecular weight PARP binding partners as claimed in claim 5 for the diagnosis or therapy of pathological states in the development and/or progress of which at least one PARP protein, or a polypeptide derived there from, is involved.

32. (withdrawn) The use of low molecular weight PARP binding partners as claimed in claim 5 for the diagnosis or therapy of pathological states mediated by an energy deficit.